

Outdoor Water Conservation Strategies

Water Conservation Task Force
November 3, 2006



Existing Outdoor Water Conservation Programs

Existing Program	Participation Level
Irrigation System Audits and Rebates	Medium
Targeted marketing to the highest 1,000 customers with ET Information	Medium
Rainbarrel Sales and Rebates	Medium
Rainwater Harvesting Rebates	Low
Waterwise Landscape and Soil Rebates	Low
Recommended Summer and Drought Watering Schedules	Voluntary
Water Use Management Ordinance	Required

Additional Outdoor Water Conservation Strategies

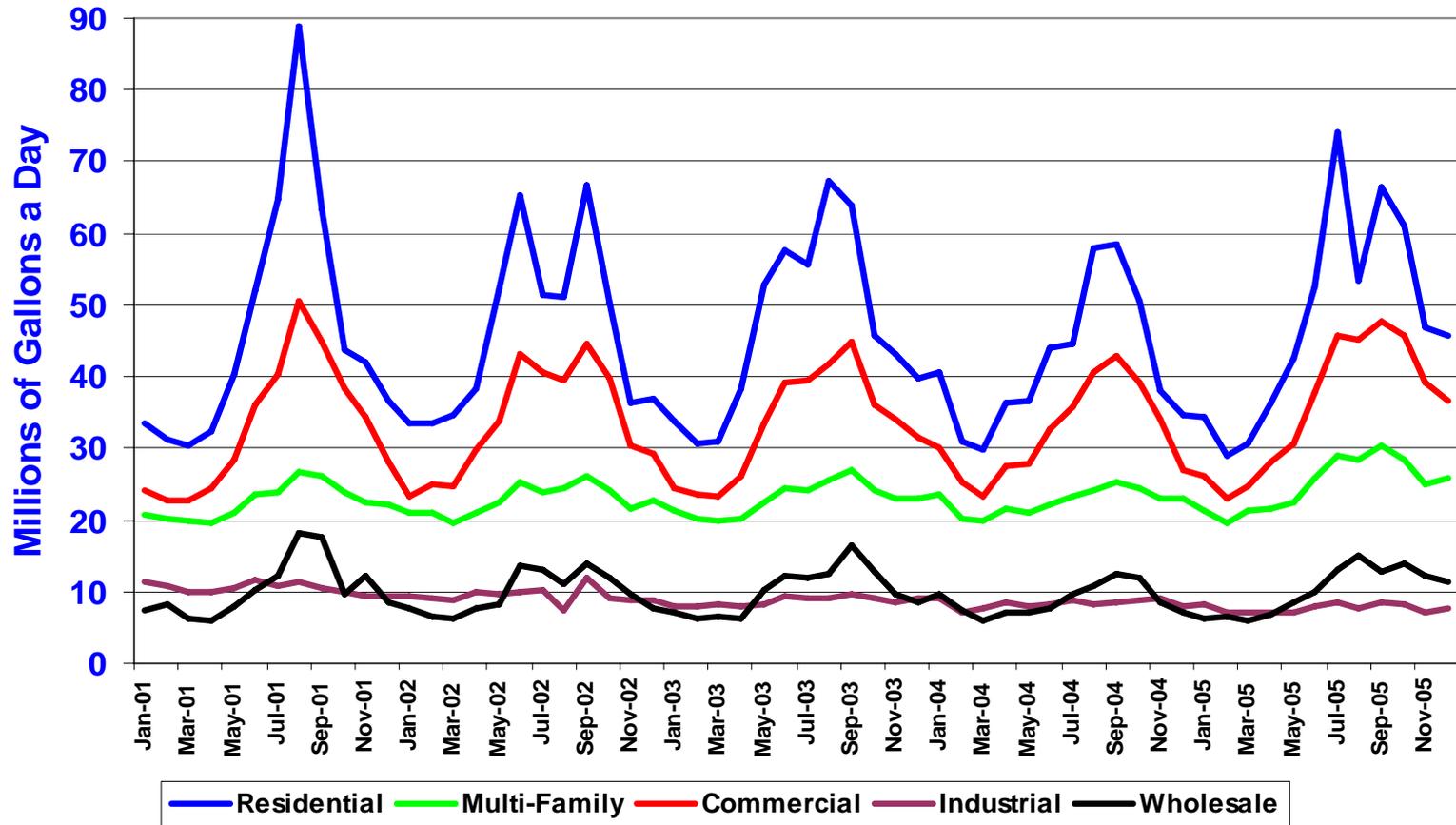
- Outline
 - Overall problem with the current status of outdoor water use in Austin
 - Solutions to the problems
 - Staff recommendations for programs
 - Water conservation savings

Outdoor Water Use

- Outdoor water use is what drives peak day use for the City of Austin
 - Irrigation water use accounts for more than 50% of Austin's peak-day water use
 - Irrigation water use accounts for approximately 35% of yearly water use
- Causes:
 - Availability of unlimited potable water for outdoor use
 - Inappropriate landscape choices
 - Increased use of automatic irrigation systems
 - Inefficient, poorly designed irrigation systems
 - Lack of soil depth, requiring excessive watering
 - Run times are not seasonally adjusted

Water Use by Customer Class

2001 - 2005



Outdoor Conservation Approaches

- Prohibit potable water use for irrigation
- Adopt strategies to minimize or eliminate the need for potable water for irrigation

Potential Outdoor Strategies

- Enhanced water use management regulations
- Irrigation system design/permitting requirements
- Commercial irrigation standards
- Residential landscape ordinance
- WaterWise landscape option on new homes
- Annual irrigation analyses for non-residential properties
- Rainwater and condensate harvesting incentives and/or requirements for new construction
- Ornamental ponds, wet ponds, and green roof watering

Related Outdoor Strategies

to be discussed at the 12/1/06 Utility Strategies meeting

- Conservation rates for multi-family and industrial, commercial and institutional (MF/ICI) customers
- Water budgeting for MF/ICI customers
- Prohibiting property owner association regulations and restrictive covenants that undermine water conservation
- Amending stormwater requirements to encourage conservation
- Accelerating construction of reclaimed water infrastructure



Enhanced Water Use Management Regulations

- Current ordinance does not:
 - Restrict properties from over-watering
 - Restrict watering between 10 a.m. - 7 p.m. year-round
 - More water lost to evaporation and wind
 - Restrict daytime residential watering
- Current Water Use Management Ordinance needs greater enforcement
- Over-seeding with winter grasses is becoming an issue

Enhanced Water Use Management Regulations

- Solutions:
 - Require all customers to follow a once every 5 day schedule in the summer months
 - Limit ICI/MF to watering no more frequently than once every 5 days throughout the year
 - Not to exceed the ET amount
 - Prohibit daytime watering at residential properties with irrigation systems
 - Extend prohibited watering hours (10 a.m. to 7 p.m.) to apply to year-round irrigation water use
 - Enhance enforcement

Enhanced Water Use Management Regulations

- Staff Recommendation:
 - Require ICI/MF properties to water no more than once every 5-days year round
 - Prohibit automatic irrigation system use for all customers between 10 a.m. and 7 p.m. year round
 - Require rain shut-off devices on all automatic irrigation systems by a set date
 - Devices must be operational at all times and set to shut off after 1/8 inch of rain
 - Require all hose-end sprinklers to use a hose timer
 - Prohibit over-seeding of established grass
 - Except when explicitly for erosion control



Enhanced Water Use Management Regulations

- Projected water savings for the City:
 - 1.3 - 4.1 MGD Peak Day in ten years
- Projected savings for the customer:
 - A minimum of 4,000 gallons per summer month or approx. \$15/month
- Projected cost to the City:
 - Cost per gallon saved: \$0.075
 - 3 FTEs: \$150,000,
 - 3 vehicles at \$25,000 each
- Projected cost to the customer:
 - Rain shut-off installation (approximately \$50 -\$80)
 - City will offer rebates until ordinance takes effect

Residential Irrigation System Standards and Permits (new installations)

- Problem:
 - Although Texas is one of the only states to license irrigators, there is still a lack of regulation, oversight and enforcement in residential irrigation system design and installation
 - AWU irrigation staff have observed water loss of 20 to 50 percent from inefficient system design
 - Irrigation system standards and permits would raise the quality of the whole industry

Residential Irrigation System Standards and Permits (new installations)

- Solutions

- Prohibit irrigation systems on new homes
- Require irrigation systems to meet efficient design requirements

Residential Irrigation System Standards and Permits (new installations)

- Staff Recommendation:
 - Require new irrigation systems to obtain a permit and submit a design plan adhering to certain standards before installation
 - Require final inspection of new irrigation systems
 - Require installers to provide the owner with an as-built design plan and water budget

Residential Irrigation System Standards and Permits

New automatic irrigation system requirements:

- Valves and circuits separated based on water use (hydro-zone)
- Sprinkler head spacing designed for head-to-head coverage or heads to be spaced as per manufacturer's recommendations and adjusted for prevailing winds. Meet benchmark distribution uniformity percentage
- The system designed for minimum run-off, with no direct over spray onto non-irrigated areas
- Pressure regulation components required where dynamic pressure exceeds manufacturer's recommended operating range (30-60 psi).

Residential Irrigation System Standards and Permits, cont.

New automatic irrigation system requirements:

- A weather based controller meeting City specifications.
- A rain shut-off device or other similarly effective technology installed.
- Installation of a master valve will prevent leaks in the main lines when the system is not operating.
- No spray irrigation on areas less than 4 feet in width

Residential Irrigation System Standards and Permits, cont.

- Irrigation construction plans shall include a water budget. A water budget should include:
 - Estimated monthly water use (in gallons per application) and irrigated area (in square feet)
 - Precipitation rates for each valve circuit
 - Monthly irrigation schedule for the plant establishment period (first three months) and recommended yearly watering schedule, including seasonal adjustments
 - Location of emergency irrigation system shut-off valve
 - The distribution uniformity percentage for the system
- Information must be made available to the City and property manager or owner

Residential Irrigation System Standards and Permits

- Projected water savings for the City:
 - Peak day water savings from design standards: 2 MGD after 10 years
 - Peak day water savings from weather based controllers: 0.7 MGD after 10 years
- Estimated cost to City:
 - Cost per gallon saved: \$0.07
 - 4 additional FTEs: \$200,000
- Estimated cost to customers
 - Permit fee: \$30-50
 - Additional costs to meet requirements (master valve, weather based controller) approximately: \$100 - \$300

Commercial Irrigation System Design Requirements (new installations)

- Problem:
 - Although there is a permitting program for commercial properties, new systems still waste a significant amount of water

Commercial Irrigation System Design Requirements (new installations)

- Solutions:
 - Additional irrigation system design criteria
 - Weather based irrigation controller requirement
 - Additional soil depth requirement
 - Landscape requirements

Commercial Irrigation System Design Requirements (new installations)

Staff Recommendation:

- Require additional guidelines for new automatic irrigation systems:
 - Must be designed for zero runoff
 - Sprinkler arc must not pass across a paved area.
 - System may not spray water on a median, buffer strip or parking lot island less than five feet wide.
 - Require master valve
 - Must meet benchmark distribution uniformity percentage

Commercial Irrigation System Design Requirements, cont. (new installations)

Staff Recommendation:

- Require weather based irrigation controllers
- Require 8" minimum soil depth for new development
- Require landscapes with turf grasses and plant species from City's preferred plant list
- Require water budgets to include distribution uniformity percentage
- Require an as-built plan

Commercial Irrigation System Design Requirements (new installations)

- Projected water savings for City:
 - Peak day water savings, 1.5 MGD after 10 years
- Projected costs to City:
 - Cost per gallon of water saved: \$0.07
 - 2 additional FTEs needed: \$100,000
- Projected costs to customer:
 - Cost of drip versus spray irrigation

New Residential Development Landscape Ordinance

- Problem:
 - Austin landscapes include non-native/adapted plants and grasses
 - Homeowners are often unfamiliar with plant water requirements
 - Native soil depth in Austin is often insufficient to support the types of landscape aesthetics homeowners desire, resulting in excessive irrigation.

New Residential Development Landscape Ordinance

- Solutions:
 - Prohibit turf for new homes
 - Require WaterWise landscaping with no more than 50% turf grass for new homes
 - Require all new turf grass to meet dormancy requirements
 - Require homebuilders to offer a WaterWise landscape option to prospective home buyers
 - WaterWise plants must be from City's preferred plant list
 - Mandate soil depth requirement for new landscapes

New Residential Development Landscape Ordinance

- Staff Recommendation:
 - Require all new turf grass to meet dormancy requirements
 - Recently completed turfgrass study by TAMU and the Texas Turfgrass Producers will determine initial grasses approved
 - Ongoing testing of new varieties will allow new grasses to be approved as they are developed
 - Require minimum soil depth of 8”
 - City soil specification will meet COA water quality standards that include a minimum amount of organic material

New Residential Development Landscape Ordinance

- Projected water savings for City:
 - Peak day water savings from soil depth and turfgrass requirements: 0.8 MGD after 10 years
- Estimated cost to the City:
 - Cost per gallon saved: \$0.19
 - 3 FTEs (enforcement): \$150,000
- Estimated cost to customer:
 - No incremental cost for Bermuda vs. St. Augustine
 - Additional cost of soil (when supplemental soil is necessary), \$0 to \$2000

WaterWise Landscape Option for New Homes

- Problem:
 - Prospective homebuyers are not presented with low-water use landscape options

WaterWise Landscape Option for New Homes

- Staff Recommendation:
 - Homebuilders must offer a WaterWise landscape option in any series of landscape options offered to prospective home buyers
 - WaterWise landscape option must be comprised of plants from the City of Austin preferred plant list and no more than 50% approved turfgrass with dormancy capabilities
 - Rain garden would be an option

WaterWise Landscape Option for New Homes

- Projected water savings:
 - Peak day water savings after ten years: 0.4 MGD
- Estimated cost to the City:
 - Cost per gallon saved: \$0.12
 - 1 FTE education/enforcement: \$50,000
- Estimated cost to customers:
 - Additional cost of landscape

Annual Irrigation System Analyses for non-residential properties

- Problem:
 - Significant over-watering at large properties
 - Inefficiencies go unchecked and are not repaired
 - Irrigation maintenance contracts often do not provide for an overall analysis with projected water use amounts for property owners/managers

Annual Irrigation System Analyses for non-residential properties

- Solutions:
 - Require mandatory annual irrigation system analyses for all non-residential properties with automatic irrigation systems
 - Irrigation audits can result in savings of up to 15% or more per water account

Annual Irrigation System Analyses for non-residential properties

- Staff Recommendation:
 - Require properties over 2 acres with automatic irrigation systems to submit annual irrigation analyses
 - Could potentially include all properties over 1 acre
 - Require analyses to be done by a licensed irrigator and submitted to AWU by May 1st of each year
 - Analyses must be signed by property manager or owner
 - Municipal properties must adhere to the requirement

Annual Irrigation System Analyses for non-residential properties

- Estimated water savings:
 - Peak day savings: 1 - 1.4 MGD after ten years
- Estimated cost to City:
 - Cost per gallon saved: \$ 0.07
 - 2 FTEs for tracking and review: \$100,000
- Estimated cost to customer:
 - Cost of audit by a licensed irrigator

Alternative Water Sources

- Problem:
 - ICI/MF properties use too much potable water on landscape when other sources are available
 - Alternative water sources such as rainwater and AC condensate could potentially be reused as irrigation.

Alternative Water Sources Collection

- Solutions:
 - Prohibit potable water use for ICI/MF irrigation
 - Require a minimum amount of rainwater storage capacity on new ICI/MF construction
 - Require a minimum amount of rainwater storage capacity on new residential construction
 - Increase rainwater harvesting rebates for ICI/MF and residential customers
 - Require new residential areas to be plumbed for graywater reuse

Alternative Water Sources Collection

- Staff Recommendation:
 - Require 30 days of alternative water storage capacity (rainwater, AC condensate) on new ICI/MF construction over 2 acres in size
 - Require the use of reclaimed water if available for all ICI/MF for all new construction

Alternative Water Sources Collection

- Projected water savings:
 - Peak day water use savings after ten years: 1 – 1.5 MGD
- Estimated costs to City:
 - Cost per gallon saved: \$0.05
 - 1 FTE for enforcement: \$50,000
- Estimated payback for customer:
 - 15 - 30 years depending on AWU rate structure

Ornamental Ponds, Wet Ponds, and Green Roofs

- Problem:
 - Ornamental ponds, wet ponds use potable water for make-up water
 - Green roofs have the potential to be a sizable additional demand on the water system

Ornamental Ponds, Wet Ponds, and Green Roofs

- Staff Recommendation:
 - Ornamental Ponds – Ponds designed primarily for aesthetic or ornamental purposes shall not use potable water.
 - Wet Ponds – Wet ponds shall be designed so that no potable water is used after one year of plant material establishment.
 - Green Roofs – Green roofs shall be designed so that no potable water is used after one year of plant material establishment.

Ornamental Ponds, Wet Ponds, and Green Roofs

- Potential water savings
 - Peak day water use savings: 1 - 5 MGD after ten years
 - Savings will depend heavily on the number of green roofs, ornamental ponds and wet ponds to be built over ten years

Total Indoor Savings

Program	Water Savings (MGD)
Mandatory toilet retrofits	2.2 – 2.7
Submetering	0.7
Plumbing code changes	1.2
Cooling towers	1.5
Car washes	0.2
Total	5.8 – 6.3

Projected Water Savings

Program	Water Savings (MGD)	Water Savings Cumulative (MGD)
Indoor Programs <i>(passed on first reading)</i>	5.8 – 6.3	5.8 – 6.3
Enhanced Water Use Management Ordinance	1.29 - 4.12	7.09 – 10.42
Residential Irrigation Design Standards	2.7	9.79 – 13.12
Commercial Design Standards	1.5	11.29 - 14.62
Residential Landscape Requirements	0.8	12.09 – 15.42
Large Property Irrigation Analyses	1 - 1.4	13.49 – 16.82
Alternative Water Sources	1 – 1.5	14.49 – 18.32
Ornamental Ponds, Wet Ponds, and Green Roofs	1 - 5	15.49 – 23.32